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Kenji Fukui

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GREENBERG TRAURIG LLP (LA)

2450 COLORADO AVENUE, SUITE 400E

INTELLECTUAL PROPERTY DEPARTMENT

SANTA MONICA, CA 90404

EXAMINER

MENDEZ, ZULMARIAM

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



**DETAILED ACTION**

***Election/Restrictions***

1. Newly submitted claims 12-14 directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: independent claims 12 and 14 disclose different embodiments from the electrolysis cell, as recited in the original claim 1, as follows:

- Claim 1 requires a flat proton ion exchange membrane placed in between and fixedly attached to two flat mesh electrodes, whereas claim 12 requires 3 flat mesh electrodes and a flat proton ion exchange membrane having a first side and a second side wherein the first electrode is coupled to an parallel with the first side of the membrane, the second and third flat mesh electrodes are coupled to and parallel with the second side of the flat proton ion exchange membrane.
- Claim 1 requires a flat proton ion exchange membrane placed in between and fixedly attached to two flat mesh electrodes, whereas claim 14 requires a first structure accommodating a first flat proton ion exchange membrane placed in between two flat mesh electrodes and a second structure coupled to the first structure in such a way that both structures are in fluid communication with each other.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 12-14 are withdrawn from consideration

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as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1-9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ezzell et al. (US Patent no. 4,265,719) in view of Giuseppe (EP 0276789).

With regard to claims 1, 5, 6 and 9, Ezzell discloses an electrolysis cell comprising: a structure having at least one inlet channel (32, col. 4, lines 59-61), a first outlet channel (34), and a second outlet channel (128, see figure 1); said structure accommodates a flat proton ion exchange membrane (12, col. 8, lines 10-12) placed in between two flat mesh electrodes (col. 3, lines 66-68; col. 4, line 1; col. 10, lines 61-62; col. 12, lines 21-22); and a power source to apply electricity to said electrodes (col. 4, lines 26-35). Even though Ezzell does not explicitly disclose wherein the inlet and

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outlets are for intake of water and output of Free Radical Solution water and hydrogen rich water, respectively, the last one being degassed for re-use, it is merely the intended use of the apparatus and is not given patentable weight. See MPEP 2111.04. Ezzell fails to explicitly disclose wherein the membrane is placed in between and fixedly attached to the electrodes and a commuting guide having at least one channel for facilitating solution flow towards the first outlet channel.

Giuseppe discloses an electrolysis cell wherein the cathode compartment comprises a cathode (C) and a distributor (D), which presses the electrode against the membrane (M; figures 1 and 2) in order to avoid vibrations of the membrane during operation, and thus avoid damaging of the membrane due to abrasions or fatigue (page 2, paragraph 9); and wherein the cell has a channel (A9) for facilitating flow of the solution towards outlet (A7).

Therefore, one having ordinary skill in the art at the time of the invention would have found it obvious to press the electrodes against the membrane, as taught by Giuseppe, in the electrolysis cell of Ezzell, in order to avoid vibrations of the membrane during operation, and thus avoid damaging of the membrane due to abrasions or fatigue.

With regard to claim 11, Ezzell discloses an electrolysis cell comprising: a structure having at least one inlet channel (32, col. 4, lines 59-61), a first outlet channel (34), and a second outlet channel (128, see figure 1); said structure accommodates a flat proton ion exchange membrane (12, col. 8, lines 10-12) placed in between two flat mesh electrodes (col. 3, lines 66-68; col. 4, line 1; col. 10, lines 61-62; col. 12, lines 21-

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22); and a power source to apply electricity to said electrodes (col. 4, lines 26-35).

Even though Ezzell does not explicitly disclose wherein the inlet and outlets are for intake of water and output of Free Radical Solution water and hydrogen rich water, respectively, the last one being degassed for re-use, it is merely the intended use of the apparatus and is not given patentable weight. See MPEP 2111.04. Ezzell fails to explicitly disclose wherein the first electrode is coated on one first side of the membrane and the second electrode coated on the second side of the membrane.

Giuseppe discloses an electrolysis cell wherein an anode compartment comprises an anode (A) pressed against one side of the membrane (M), a cathode compartment comprising a cathode (C) on a second side of the membrane (M) and a distributor (D), which presses the electrode against the membrane (M; figures 1 and 2) in order to avoid vibrations of the membrane during operation, and thus avoid damaging of the membrane due to abrasions or fatigue (page 2, paragraph 9).

Therefore, one having ordinary skill in the art at the time of the invention would have found it obvious to press the electrodes against the membrane, as taught by Giuseppe, in the electrolysis cell of Ezzell, in order to avoid vibrations of the membrane during operation, and thus avoid damaging of the membrane due to abrasions or fatigue.

With regard to claim 2, Ezzell further discloses wherein each of said flat mesh electrodes (col. 3, lines 66-68; col. 4, line 1; col. 10, lines 61-62; col. 12, lines 21-22) is comprised of two layers with a first layer having large protuberances and a second layer having smaller protuberances compared with said first layer's larger protuberances (col.

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7, lines 20-31).

With regard to claims 3 and 4, Ezzell teaches wherein said first layer with large protuberances is juxtaposed distal away from the proton ion exchange membrane surface (col. 10, lines 21-24) whereas the second layer with smaller protuberances is juxtaposed facing the proton ion exchanged membrane (col. 10, lines 30-32).

With regard to claims 7 and 8, Ezzell discloses a control circuit that adjusts inlet water flow and/or electric power (col. 11, lines 11-23; see also table 1 – variation of current density).

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ezzell in view of Giuseppe, as applied to claim 1 above, and further in view of Sumita (US Patent no. 7,090,753).

With regard to claim 10, the modified Ezzell discloses all of the features, as applied to claim 1 above, but fails to teach wherein the cell further comprises an Oxidation Reduction Potential (ORP) sensor for measuring the ORP level of the solution.

Sumita discloses an electrolytic cell suitable for monitoring charges or the like by using an ORP sensor which measure the oxidation-reduction potential at the surface of an electrode as a standard of another electrode for confirming charges of electrolytic solution (col. 2, lines 39-51). Therefore, one having ordinary skill in the art at the time of the invention would have found it obvious to use an ORP sensor, as taught by Sumita, in the electrolytic cell of the modified Ezzell, in order to confirm charges of the electrolytic solution.

***Response to Arguments***

6. Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground of rejection. The applicant argues wherein Ezzell does not explicitly disclose an electrolysis cell including a pair of flat electrodes **coupled to** (e.g., fixedly attached or coated onto) a flat portion of the membrane, as recited in amended claim 1. However, the examiner has presented a new ground of rejection above due to the amendment.

***Conclusion***

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.



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Any inquiry concerning this communication or earlier communications from the examiner should be directed to ZULMARIAM MENDEZ whose telephone number is (571)272-9805. The examiner can normally be reached on Monday-Thursday, 8:30am-5:00pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Z. M./

Examiner, Art Unit 1795

/Alexa D. Neckel/

Supervisory Patent Examiner, Art Unit 1795